



国立研究開発法人理化学研究所 仁科加速器研究センター
第227回 RIBF核物理セミナー
RIKEN Nishina Center for Accelerator Based Science
The 227th RIBF Nuclear Physics Seminar

Microscopic particle-vibration coupling calculations with applications to single-particle, collective and charge-exchange nuclear transitions

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In this talk, an attempt will be made to review the present status of calculations based on a specific implementation of Density Functional Theory, that is, non-relativistic Skyrme functionals. These functionals have reached a quite high level of sophistication. At the same time, there are important elements of the nuclear phenomenology that cannot be explained within this framework: to name a few, the fragmentation of single-particle and collective excitations, or the details of their particle and gamma decay.

Thus, we will describe a complementary approach which is based on particle-vibration coupling (PVC). The formalism that we shall describe is, in principle, non-perturbative and contains no adjustable parameters.

Various applications to low-lying states in odd nuclei and giant resonances will be discussed. Particular emphasis will be given to charge-exchange excitations, like the Gamow-Teller in magic and superfluid nuclei. In this latter case, the respective roles of PVC correlations and isovector/isoscalar pairing will be elucidated.

* The talk will be given in English language..

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